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Citation	熱帯医学 Tropical medicine 10(3). p127-153, 1968
Issue Date	1968-11-20
URL	http://hdl.handle.net/10069/4036
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New Species of Mosquitoes from Taiwan (Diptera : Culicidae)

Part IV. *Mattinglyia catesi*, n. gen., n. sp. and Four New Species of Genus *Heizmannia* Ludlow*

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(Received for Publication August 24, 1968)

Abstract

The present paper describes the larvae, pupae, and male and female adults of five new species of mosquitoes. A new genus *Mattinglyia* is erected for one of the five, the remaining four are members of the genus *Heizmannia* s. str. The species described are named *Mattinglyia catesi*, n. gen., n. sp., *Heizmannia cheni*, n. sp., *Heizmannia chengi*, n. sp., *Heizmannia nivirostris*, n. sp., and *Heizmannia taiwanensis*, n. sp. All of these mosquitoes were found in forested hilly areas on Taiwan Proper. The morphological descriptions, the distribution, biology and systematics of the species are discussed.

Nineteen recognized species of *Heizmannia* have been reported from Oriental, Indomalayan, and Papuan areas. Of these, seven species are known only by female (one with uncertain association of male) and one known only by the male. Their immature stages are even less known. The pupal stage of six species and the larval stage of eight species, including two species with uncertain association of larva, are known so far. *Dendromyia achaetae* Lei-

cester, 1908, because of its uncertain systematic position, was transferred to genus *Haemagogus* by Edwards(1922, 1928), Barraud (1934) and Causey(1937), and later transferred to *Heizmannia* by Mattingly (1957), Macdonald(1957), and Thurman(1959). Mattingly(1957) states that this species is very different from any other in the genus *Heizmannia* and that when more information is available it may be necessary to transfer

*This study was conducted with aid from the U. S. Naval Medical Research Unit No. 2 including funds made available through Public Law 480, Section 104(c), and in part through funds provided by the Bureau of Medicine and Surgery, Navy Department, for Work Unit MR005. 09-0083. The opinions and assertions contained herein are those of the author and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

**Special contribution

it to another genus. Mattingly(1959) also states that he received the male of *H. achaetae* from Malaya and that Mrs. Thurman found a new species in Group B, including the male, from Thailand. However until now these specimens have not yet been described.

During the course of mosquito studies in Taiwan the author found a new species of mosquito with characters common to the group B of *Heizmannia* of Mattingly(1957) which was erected for *H. achaetae*. Recently the author obtained a male and a female adult with their corresponding larval and pupal skins, and another male and 22 female adults of this new mosquito from Taiwan. In every stage this mosquito has characteristics uncommon to any known species of the genus *Heizmannia* s. str. Therefore, a new genus *Mattinglyia* is erected here for this new mosquito and also for *Dendromyia achaetae* Leicester, 1908. The occurrence of the mosquitoes belonging to the genera *Heizmannia* s. str. and *Mattinglyia*, n. gen. is quite rare in Taiwan. Up to present four species of the genus *Heizmannia* s. str. have been found on Taiwan Proper and described here as new to science. One of these was previously treated by Lien

(1962) as *Heizmannia lii* Wu in accordance with the suggestion of Dr. P. F. Mattingly (personal communication, 1961) who kindly compared the author's drawing of male terminalia of the Taiwan specimen with the terminalia of the paratype male of *H. lii* in the British Museum (Natural History). According to him there appeared to be no significant differences between the two. However, the author is of the opinion that they are different. The Taiwan specimens have a small patch of pale scales on the basal part of the proboscis ventrally, some pale scales on the basal joint of the antennal flagellum, and a large patch of pale scales on the posterior pronotal lobes. These important characters were not mentioned in the original description by Wu(1936). It is, therefore, very likely that *H. lii* has no pale scales on the basal part of proboscis ventrally, no pale scales on the basal joint of antennal flagellum, and no pale scales on posterior pronotal lobes. Terminology used for description largely conforms to that of Belkin(1962). The following are the descriptions of the new genus and the five new species.

GENUS *MATTINGLYIA*, N. GEN.

Dendromyia Leicester, Stud. Inst. med. Res. F. M.S., 3(3): 257, 1908 (*nec* Theobald) (*partim*, *D. achaetae* n. sp. only).

Haemagogus Edwards, Indian J. med. Res., 10: 449, 1922, and J.F.M.S. Mus., 14:52, 1928 (*nec* Williston) (*partim*, *H. achaetae* only).

Heizmannia Mattingly, The Culicine Mosquitoes of the Indomalayan Area, Part II, 5, 1957; Thurman, A Contribution to a Revision of the Culicidae of Northern Thailand, 66, 1959 (*nec* Ludlow) (*partim*, *H.*

achaetae only).

Orthotype: *Mattinglyia catesi*, n. gen., n. sp.

Mattingly(1957) erected Group A(*Heizmannia* s. str.) and Group B for the known species of *Heizmannia*. Since the immature stages and the male of a new species belonging to the Group B of Mattingly, 1957, were obtained and found to be very distinctive from the genus *Heizmannia* Ludlow, a new genus is described below. This differs from *Heizmannia* Ludlow, 1905, by having strongly

toothed fore- and mid-claws in female, no group of setulae on postnotum, and no lower mesepimeral bristle; from *Haemagogus* Williston, 1896, by having a patch of broad scales on alula, 1-2 postspiraculars, and 1-2 sternopleurals; from *Aedes* Meigen by having unusually close pronotal lobes, unusually large paratergite, and only one or two sternopleurals.

ADULTS (Fig. 1, e-h). Palpus short in both sexes; female antenna normal, with antennal flagellar segments subequal in length; male antenna plumose, apical two segments of antennal flagellum elongate; eyes wide apart; vertex with flat scales; erect scales on nape; anterior pronotal lobes widely separated but still unusually close, with flat scales; posterior pronotal lobes with bristles posteriorly; mesonotum and scutellum with flat scales; postnotum bare; paratergite unusually large, nearly touching prealar knob; pleuron with patches of silvery white broad flat scales; postspiraculars, lower sternopleurals, prealars, and upper mesepimerals present; spiraculars, upper sternopleurals and lower mesepimerals absent; wing dark-scaled; squama fringed; alula with a patch of broad scales; anterior fork cell only slightly longer than its stem; vein-6 ending well beyond fork of vein-5; tarsus dark; apical segment of foretarsus of male with posterior projection subbasally; fore- and mid-claws strongly toothed in both sexes; structure of male terminalia (Fig. 1, i-l) relatively simple; clasper elongate, not expanded apically; spiniform short, blunt; two lobes near apex of sidepiece, one carrying flattened leaflets, the other carrying a tuft of hairs; no hair-tufts on inner side of sidepiece toward

base; claspette stem large, carrying leaflets apically; tergomesal lobe large with flattened and recurved spines; phallosome divided into small lateral plates, each with strongly curved teeth on apical portion and small teeth on basal portion; proctiger simple; ninth tergite divided into two lobes; ninth sternite small, only slightly larger than ninth tergite, with three lobes; female ninth tergite undivided; postgenital plate bilobed.

PUPA (Fig. 4, g-h). Similar to *Heizmannia* s. str. except that paddle is relatively oval, wide near apex (rather elongate, narrow near apex in known pupae of *Heizmannia* s. str.); apex of male sidepiece lobes wide.

LARVA (Fig. 4, a-f). Differing from *Heizmannia* s. str. as follows: Antennal shaft much as in *Aedes* (*Stegomyia*), short, straight, smooth, with a short simple hair inserted slightly beyond middle; head hairs 4, 6-C more anterior than those in *Heizmannia* s. str., distance between 6-C and 5-C about equal to or slightly larger than distance between 7-C and 5-C (the former is smaller than the latter in species of *Heizmannia* s. str. found in Taiwan); hair 1-X well developed as in *Aedes* (*Stegomyia*); comb of irregularly arranged teeth; pecten teeth with a few denticles on both sides.

BIONOMICS. The immature stages breed in bamboo-stumps. The adult females bite man viciously during daytime. Their attitude on flight resembles that of *Tripteroides*.

REMARKS. This genus is named in honor of Dr. P. F. Mattingly of the British Museum (Natural History) in recognition of his excellent contributions to the study of Culicidae.

MATTINGLYIA CATESI, N. GEN., N. SP.

MALE(Fig. 1, f, h-1). *Head*. Palpus and proboscis dark; palpus about one-seventh length of proboscis; proboscis rather slender, slightly curved downward at apical third, about 1.2 times length of forefemur; clypeus, torus and antenna dark, antenna plumose, with fairly long flagellar bristles on basal 11 segments and shorter bristles and pubescence on apical two segments, terminal segment about 1.5 times as long as penultimate one, both together about combined length of first 11 segments; eyes separated by about width of one torus; vertex entirely covered with black metallic broad flat scales except a silvery white patch in front between eyes; some erect scales on nape; no pale border round eye margins. *Thorax*. Anterior pronotal lobes widely separated but still unusually close, with silvery white scales on entire upper surface; posterior pronotal lobes dark, with a white broad scale on middle aspect, otherwise devoid of scales; mesonotum covered with dark brown scales showing golden lustre; scutellum with a large patch of broad white scales on midlobe and dark scales on lateral lobes; postnotal bristles entirely absent; a patch of silvery white scales present on paratergite, propleuron, subspiracular area, upper and lower sternopleuron, anterior mesepimeron and anterior portion of all coxae; fore- and mid-femora pale basally on underside; basal half of hindfemora nearly completely pale, leaving only a narrow dark line above; tibiae and trasi all dark; apical segment of foretarsus with posterior projection subbasally; fore- and mid-claws strongly toothed, foreclaws much larger than mid- and hindclaws; wing scales, narrow, scanty especially on vein-6, plume scales on middle third

of vein-2.1 with about five striations; anterior fork cell about 1.2 times as long as its stem; haltere knob dark. *Abdomen*. Tergites with a narrow pale area at sides on I and a large baso-lateral silvery white patch at sides on II-VII, silvery white patches on V-VII produced onto dorsum to form complete basal bands; sternites with basal silvery white bands on II-VI. *Terminalia* (Fig. 1, i-1). Sidepiece elongate with two lobes near apex, ventral one carrying two long leaflets with recurved tip, dorsal one large, very much protruded, carrying numerous hairs; basal tergomesal lobe large carrying 13 flattened recurved setae; basal area of lobe with numerous small setae on ventral side; claspette stem stout; claspette filament represented by seven flattened leaflets; clasper elongate, tapering near apex; spiniform short, blunt; phallosome divided into small lateral plates, each with 8-9 strongly curved teeth on apical portion and 5-6 small teeth on basal portion; proctiger ending into a blunt tooth; ninth tergite divided into two lobes, each with three short setae; ninth sternite small, only slightly larger than ninth tergite, with three lobes, median lobe with three long setae.

FEMALE(Fig.1, e, g). Agreeing with male in general coloration. Antenna normal, with sparse flagellar bristles and short pubescence, flagellar segments nearly all subequal in length, more apical ones only slightly longer than more basal ones; palpus about one-sixth length of proboscis; proboscis less curved downward than in male, about 1.3 times as long as forefemur; vertex with indistinctly pale lateral patches in addition to silvery white patch in front between eyes; posterior pronotal lobes with 2-3(bare or with at most

ten broad white scales in some paratype specimens) broad white scales on middle aspect; anterior fork cell about 1.1 times as long as its stem; basal half of hind femora more extensively pale, dark dorsal stripe confined to basal one-sixth; apical segment of foretarsus normal, straight; fore- and mid-claws strongly toothed; foreclaws not much larger than mid- and hind-claws; ninth tergite bilobed, U-shaped, undivided; postgenital plate bilobed.

LARVA (Fig. 4, a-f). *Head*. Antennal shaft slender, about 7.2 times as long as its basal diameter, smooth, straight, uniformly light brown; hair 1-A single, inserted slightly beyond middle; 1-C slender, about as long as distance between hairs, apical portion curved inward; 7-C posterior to level of base of antenna, with 13-15 plumose branches; 6-C slightly anterior to level of base of antenna bifid; 5-C with 10-11 plumose branches, posterior to 7-C; 4-C with about 20 branches, at about level of base of antenna; bases of hairs 5-7-C forming a regular triangle; 8,9-C both single, 10-C bifid or trifid; 11-C with 12-13 plumose branches; 12-C bifid; 13-C single; 14-C stout, bifid or trifid; 15-C 6-branched; mentum with 21 teeth; median hairs of mouth brush simple. *Thorax*: Prothoracic hair 0-P 5-branched; 1-P strong, with 3-4 plumose branches; 2-P slender, single; 3-P slender, trifid; 4-P trifid; 5-P strong, with three plumose branches; 6-P single, plumose; 7-P strong, with 3-4 plumose branches; 8-P 6-branched; 9-12-P arising from a common plate, 9-P trifid; 10, 12-P both single; 11-P small, furcated into four; 14-P trifid. *Abdomen*. Eighth abdominal segment with comb of 15-20 sharply pointed teeth, each tooth with fine fringe laterally on basal attachment; hair 1-VIII with 3-4

long plumose braches; 3-VIII with five long plumose branches; 5-VIII with four plumose branches; 2, 4-VIII both single; siphon without acus (in larval skin of allotype female a pair of weakly sclerotized detached acus are seen); index about 1.8 times in compressed specimen; 1-S 3-branched, inserted at about middle of siphon; pecten of five teeth, each with a few denticles on both sides; anal segment incompletely ringed, posterior margin of saddle with very fine spicules; hair 1-X well developed, with two long plumose branches; 2-X with four long simple branches; 3-X single, single; 4-X consisting of eight hairs, each with 2-3 long branches; anal gills very long, about 4.5 times the length of anal segment, with rounded ends.

TYPE SPECIMENS. Holotype, male (78622.2) with larval and pupal skins, bamboo-stump, Yuehmei (100 meters), Sanlin, Kaohsiung Hsien, Taiwan, August 27, 1963, P.S. Chen; allotype, female (78622.1) with larval and pupal skins, same data as for holotype; paratypes, 19 females (62588.1-19), caught when biting man at Mashihshih (680 meters), Taiwu, Pingtung Hsien, Taiwan, 2-2:30 p.m., October 11, 1963, J. C. Lien; a male (60709.1) and three females (62709.2-4), caught when resting or attacking man, Taiwu, Pingtung Hsien, Taiwan, October 11, 1965, S. Y. Lin. The type specimens are in the collection of Taiwan Provincial Malaria Research Institute, Nankang, Taipei, Taiwan, Republic of China.

DISTRIBUTION. Known only from the type localities.

BIOLOGY. The larva breeds in bamboo-stumps. The females bite man viciously during daytime.

SYSTEMATICS. This species is related to

Mattinglyia achaetae (Leicester, 1908) which is known only by a single female. When compared with the description of female of *M. achaetae* by Mattingly (1957), the female of this species shows the following morphological differences: Proboscis about 1.3 times as long as forefemur (v.s. about equal to forefemur); *ppn* bare or with at most ten broad white scales on middle aspect (v.s. all but upper portion of *ppn* covered with bright metallic

silvery scales); wing scales narrow (v.s. broad or moderately broad); dark dorsal stripe of hindfemur confined to basal one-sixth (v.s. dark dorsal stripe not interrupted).

REMARKS. This species is named in honor of Dr. M. D. Cates, entomologist of the Department of Medical Ecology, U. S. Naval Medical Research Unit No. 2, Taipei, Taiwan, in appreciation of his valuable advice and assistance in reading the manuscript.

GUNUS HEIZMANNIA LUDLOW

Heizmannia Ludlow, Canad. Ent., 37:130, 1905.

Phoniomyia Theobald, Ann. Hist. nat. Mus. hung., 3:114, 1905 (*partim*, *Ph. indica* n. sp. only).

Wyeomyia Theobald, J. Bombay nat. Hist. Soc., 16:247, 1905 (*nec* Theobald, 1901).

Wyeomyia Leicester, Stud. Inst. med. Res. F. M.S., 3(3): 250, 1908 (*nec* Theobald).

Phoniomyia Leicester, Ibid, p. 253, 1908 (*nec* Theobald).

Dendromyia Leicester, Ibid, p. 254, 1908 (*nec* Theobald) (*partim*, *D. communis*, n. sp. and *D. aureochaeta* only).

Bobodeomyia Theobald, Rec. Indian Mus., 4:31, 1910.

Type species: *Heizmannia sintillans* Ludlow.

This genus includes all the species of Group A (*Heizmannia* s. str.) of Mattingly (1957). Including the four new species described below, 22 recognized species are known to occur in Oriental, Indomalayan, and Papuan areas.

ADULTS (Figs. 1, a-d, 2, a-k, 3, a-k). Palpus short in both sexes; female antenna normal, with antennal flagellar segments subequal in length; male antenna less plumose, apical two segments of antennal flagellum elongate; eyes wide apart; vertex and occiput with flat scales; anterior pronotal

lobes very closely approximated in mid-line; posterior pronotal lobes with 2-4 bristles posteriorly; mesonotum and scutellum with flat scales; postnotum with a group of setae; paratergite moderately large, well separated from prealar knob; pleuron with patches of silvery white broad flat scales; postspiraculars, lower sternopleurals, prealars, upper and lower mesepimerals present (upper mesepimerals absent in *H. chengi*, n. sp.); spiraculars and upper sternopleurals absent; wing dark-scaled, scales narrow or broad; squama fringed; alula with a patch of broad scales; anterior fork cell 2-4 times length of stem; vein-6 ending well beyond fork of vein-5; tarsus dark; apical segment of foretarsus of male normal, straight; fore- and mid-claws simple in male (except in *H. covelli*); foretarsal claw simple in female; structure of male terminalia (Figs. 2, a-i, 3, a-k) complex; sidepiece comparatively short, wide, and rounded, with subapical lobe carrying one or two stout spines; usually several hair-tufts on inner side of sidepiece towards base, which, in some species, are remarkably long and twisted or matted; arising from inner side of sidepiece, toward sternal side, there is also a peculiar process, apparently representing "claspette";

the apical part, or filament of this structure is very transparent, and sometimes divided into leaflets, the form of which cannot usually be clearly seen; clasper short, widened apically; spiniform stout and pointed; phallosome divided into small lateral plates with teeth; paraproct ending in single blunt tooth; ninth sternite very or moderately large; female postgenital plate with distal edge smoothly rounded; ninth tergite of female divided into two separate plates.

PUPA (Figs. 5, g-h, 6, g-h, 7, g-h, 8, g-h). Trumpets more or less expanded at tip, meatus occupying almost whole length, tracheoid only at extreme base; hair 1-I dendritic; hairs 9-VII, VIII rather short, stout and dark, with at most 11 branches; paddle rather narrow, ovate, only slightly emarginated on basal half of inner face; midrib complete, conspicuously darkened; hair 1-P well developed, single or furcated into two or three apically, about a quarter or a third of length of paddle, arising just to outer side of tip of midrib; fringe composed of slender hairs occupying about distal two-thirds of both inner and outer face; accessory paddle hair absent; no setulae on segment IX; apex of male side-piece lobe narrow.

LARVA (Figs. 5, a-f, 6, a-f, 7, a-f, 8, a-f).

Antenna of moderate length, lightly spiculate, regularly tapering and slightly curved inward, two basal joints completely fused; hairs of mouth brushes simple or strongly pectinate; head hair 6-C with two very unequal branches in most species; 4-C very strongly developed with expanded base and numerous branches; mentum well developed, of normal type; maxillary spine small and inconspicuous; bases of thoracic pleural setae not enlarged, ornamented with small straight spines which may be single or bifid or may have several small secondary denticles; comb of not more than 60 scales or spines or with both mixed; siphon short and stout, tapering more strongly on distal than on proximal half; pecten with not more than about a dozen teeth on either side; a single pair of subvental hair 1-S arising just before half-way; spines at bases of dorsal valves delicate, setuliform; hairs on vental valves short; distal edge of saddle spiculate; hair 2-X with 2-4 branches; hair 3-X single or rarely bifid; hairs of ventral brush 4-X single or 2-7-branched; anal gills large, their tips bluntly rounded.

BIONOMICS. The immature stages breed in bamboo-stumps and tree-holes. The females of some species bite man viciously during daytime.

KEYS TO THE SPECIES OF *MATTINGLYIA*, N. GEN. AND *HEIZMANMIA* OF TAIWAN

Adults

1. Postnotum without a group of small setae; anterior pronotal lobes separated by width of a lobe; fore- and mid-claws of female strongly toothed; scutellum with a large silvery white patch on midlobe; paratergite unusually large, nearly touching prealar knob, covered entirely with silvery white scales; postspiracular area without scales.....

..... *Mattinglyia catesi*, n. gen., n. sp.

Postnotum with a group of small setae; anterior pronotal lobes separated by less than half width of a lobe; fore- and mid-claws of female simple; scutellum without a large silvery white patch on midlobe; paratergite moderately large, well separated from prealar knob, covered with silvery white scales only on lower aspect; postspiracular area

- with a patch of silvery white scales.....2
2. Posterior pronotal lobe with some dark scales; proboscis much longer than forefemur (1.2-1.3 times).....
..... *Heizmannia cheni*, n. sp.

Posterior pronotal lobe with a large patch of white scales; proboscis about as long as forefemur 3

3. Proboscis entirely dark ventrally; anterior pronotal lobes with pale scales on anterior one-fourth above. ... *Heizmannia chengi*, n. sp.

Proboscis with a pale patch or streak ventrally; anterior pronotal lobes with pale scales on anterior half or whole of lobe above.....4

4. Anterior pronotal lobes entirely or almost entirely pale above; margin of mesonotum in front of wing root dark-scaled; proboscis with a pale streak on basal two-thirds ventrally; the scales on the first segment of antennal flagellum dark
..... *Heizmannia nivirostris*, n. sp.

Anterior pronotal lobes pale above only on anterior half; margin of mesonotum in front of wing root pale-scaled; proboscis with a pale patch at base ventrally; the scales on the first segment of antennal flagellum white
..... *Heizmannia taiwanensis*, n. sp.

Pupae

1. Paddle with apical half noticeably larger than basal half; apex of male sidepiece lobes wide; hairs 5-IV, V about as long as or only slightly longer than segment of attachment*Mattinglyia catesi*, n. gen., n. sp.

Paddle with apical half about as large as basal half; apex of male sidepiece lobes narrow; hairs 5-IV, V, VI either shorter than or at least 1.5 times as long as segment of attachment.....2

2. Hairs 5-IV, V, VI at least 1.5 times as long as segment of attachment; hair 9-VIII

with 5-11 branches; hair 1-II with 8-11 branches*Heizmannia cheni*, n. sp.

Hairs 5-IV, V, VI shorter than segment of attachment; hair 9-VIII with 2-3 branches; hair 1-II with 3-6 or about 30 branches...3

3. Hair 9-VIII single; hairs 9-II-VI nearly as stout as 9-VII; hair 5-VI only about length of 4-VI.....*Heizmannia chengi*, n. sp.

Hair 9-VIII 2-4 branched; hairs 9-II-VI much finer than 9-VII; hair 5-VI at least twice length of 4-VI4

4. Hair 1-II with about 30 branches; hair 1-P furcated into three apically
.....*Heizmannia nivirostris*, n. sp.
Hair 1-II with 3-6 branches; hair 1-P single or furcated into two apically
..... *Heizmannia taiwanensis*, n. sp.

Larvae

1. Antennal shaft short, straight, smooth; hair 1-A represented by an unbranched seta; pecten teeth with a few denticles on both sides
..... *Mattinglyia catesi*, n. gen., n. sp.

Antennal shaft of moderate length, slightly curved inward, sparsely spiculate; hair 1-A with at least two branches; pecten teeth with a few denticles on one side or none2

2. Comb of mixed spines and scales (8-15 spines and 8-15 scales).....
..... *Heizmannia nivirostris*, n. sp.

Comb of uniformly fringed scales (there may be larger scales mixed with small scales, but these are with fine fringe apically and laterally) 3

3. Comb consisting of large and small scales (28-35 scales); hairs 1-S and 1-X both single; posterior margin of saddle with conspicuous spines.....*Heizmannia chengi* n. sp.

Comb consisting of uniformly sized scales (18-25 or 51-59 scales); hair 1-S branched; posterior margin at most with inconspicuous spicules.....4

4. Antennal hair 1-A 2-4-branched; hair 2-X bifid; hair 4-X consisting of eight hairs, each with 1-2 branches; comb of 18-25 scales *Heizmannia taiwanensis*, n. sp.

Antennal hair 1-A 4-8-branched; hair 2-X 6-7-branched; hair 4-X consisting of eight hairs, each with 3-5 branches; comb of 51-59 scales.....*Heizmannia cheni*, n. sp..

HEIZMANNIA CHENI, N. SP.

MALE(Fig. 2, a-e). *Head*. Palpus and proboscis dark; palpus about one-eighth length of proboscis; proboscis very long and slender, about 1.2 times length of forefemur; clypeus, torus and antenna dark; antenna with sparse flagellar bristles and pubescence, terminal segment about 1.7 times as long as penultimate one, both together about 1.6 times combined length of basal 11 segments; scales on first segment of antennal flagellum dark; eyes separated by less than width of one torus; vertex covered with black metallic broad flat scales on a large median area on dorsum and silvery white broad flat scales laterally, scales between eyes broad, flat, silvery white, no pale border around eye margins. *Thorax*. *Apn* with a large patch of silvery white scales anteriorly occupying most of anterior border and extending about half-way back toward posterior border; scales on *ppn* all dark; mesonotum and scutellum covered with black metallic broad flat scales; postnotum with a patch of dark bristles posteriorly; silvery white broad scales present on lower aspect of paratergite, postspiracular area, propleuron, median aspect of sternopleuron, posterior half of lower sternopleuron, and an area below upper mesepimeral bristles; same scales also present on all coxae; legs all dark except for a small area at base of fore- and mid-femora ventrally, and a pale line running nearly for whole length antero-ventrally on hindfemur; tibio-tarsal joint of hindlegs with somewhat long, roughened scales toward ven-

tral aspect; wing scales moderately broad, plume scales on middle third of vein-2.1 with about 6 longitudinal striations; anterior fork cell about two and one-half times as long as its stem; haltere knob dark. *Abdomen*. Tergites entirely dark dorsally, with a narrow pale area at sides on I and a large basolateral silvery white patch on II-VII, basolateral silvery white patch on II extending downward, connecting the basolateral patch on III; others becoming progressively shorter on succeeding segments, these triangular silvery white patches barely visible from above. *Terminalia*(Fig. 2, a-e). Sidepiece comparatively short, wide and rounded, with subapical lobe carrying one stout spine; apical tuft of sidepiece moderately developed, consisting of three flattened setae; two hair-tufts on inner side of sidepiece toward base, both tufts matted, proximal one longer; claspette stem narrow, tapering to tip; claspette filament small, apex pointed and curved inward; phallosome divided into small lateral plates, each with nine or ten teeth; proctiger ending into a pointed tooth; ninth sternite large, about as long as sidepiece, apical portion divided into three lobes, median lobe carrying five setae and three scales, basal portion modified into a smooth pouch; ninth tergite divided into two lobes, each carrying three or four small setae.

FEMALE(Fig. 1, d). Agreeing with male in general coloration. Antenna normal, with sparse flagellar bristles and pubescence; an-

tenal segments nearly all subequal in length, more apical segments only slightly longer than more basal ones; palpus and proboscis dark; proboscis about 1.3 times as long as forefemur; palpus between one-seventh and one-eighth length of proboscis; silvery white scales between eyes extending posteriorly for a short distance; lateral silvery patch extending toward dorsum along eye margins for a very short distance; ninth tergite divided into two separate plates; postgenital plate with distal edge smoothly rounded; spermatheca triple.

PUPA(Fig. 5, g-h). Hair 10-C 3-7-branched; hair 1-II 8-11-branched; 2-II about twice length of 3-II; 5-IV, V, VI at least 1.5 times length of segment of attachment; 9-11-VI finer than 9-VII; 9-VII single or 2-branched; 9-VIII 5-11-branched; paddle elongate, narrow near apex; apex of male sidepiece lobes narrow; 1-P single.

LARVA(Fig. 5, a-f). *Head*. Antenna weakly and sparsely spiculate, with hair 1-A of seven branches at basal one-third of shaft; head hairs 4-7-C all very developed; 7-C with ten plumose branches; 6-C with 2-3 plumose, stout branches; 5-C with 6-7 plumose branches; 4-C with 14-18 plumose branches; hair 1-C fairly long, slender, curved inward; 8-10-C bifid; 11-C 8-18-branched; 12-14-C 2-4-branched; 15-C 4-6-branched; mentum with 23 teeth; median hairs of mouth brush usually strongly pectinate, rarely simple. *Thorax*. Prothoracic hairs 1-3-C arising close together, 1-P with four inconspicuously plumose branches; 2-P single, 3-P bifid, 4-P bifid, 5-P with 5-6 long braches, 6-P single or bifid, long, 7-P with 4-5 long branches, 8-P with three short branches. *Abdomen*. Comb of 51-59 apically fringed scales; hair 1-VIII with 4-5

branches; 2,4-VIII both single, 3-VIII with six plumose, long branches; 5-VIII with three stouter branches; siphon without acus; index 2.8 in compressed specimen; hair 1-S 5-branched, inserted at about middle of siphon; pecten of 6-11 teeth confined to basal half of siphon, each tooth with 1-3 lateral denticles on one side; anal segment sclerotized dorsally, sclerotized part occupying less than one-half of segment; hair 1-X single, plumose; hair 2-X with five long branches; 3-X single, long; hair 4-X consisting of eight hairs, each with 4-7 branches; anal gills subequal, slender, pointed, slightly longer than anal segment.

TYPE SPECIMENS. Holotype, male (61697.6) with larval and pupal skins, ex bamboo-stump (*Phyllostachys pubescens*), Feng-chihu, Chuchi Township, Chiai Hsien, Taiwan, April 11, 1961, J.C. Lien and C.L. Chung; allotype, female(61697.7) with larval and pupal skins, same data as for holotype; paratypes, 9 males (61697.1, .2, .4, .14, .15, .18, .19, .20, .26) and 15 females (61697.3, .5, .8, .9, .11, .12, .13, .16, .17, .21, .22, .23, .24, .25, .27) with corresponding larval and pupal skins. The type specimens are in the collection of Taiwan Provincial Malaria Research Institute, Nankang, Taipei, Taiwan, Republic of China.

DISTRIBUTION. Known also from Puwei of Fanlu Township, Chiai Hsien; Kuantzulin of Paiho Township in Tainan Hsien; and Tailuku of Hsiulin Township in Hualien Hsien, Taiwan.

BIOLOGY. The larvae were found breeding together with different combination of *Toxorhynchites manicatus*, *Tripteroides bambusa*, *Armigeres subalbatus*, *Aedes chungi*, *Aedes loi*, *Aedes albolateralis*, *Culex bicornutus* etc. The number of larvae in a habitat is usually not more than 30. The females bite man viciously dur-

ing daytime.

SYSTEMATICS. This species is closely related to *H. reidi* Mattingly, differing from it in having dark scales on the first segment of antennal flagellum, a smooth pouch-like fold on the basal portion of ninth sternite, tapering claspette stem, and a small claspette filament with apex pointed and curved inward.

***HEIZMANNIA CHENGI*, N. SP.**

MALE(Fig. 2, f-j). *Head.* Palpus and proboscis entirely dark; palpus about one-eighth length of proboscis; proboscis about 1.1 times as long as forefemur; antenna dark, with sparse flagellar bristles and pubescence; terminal segment about 1.8 times length of penultimate one, both together about 1.7 times combined length of basal 11 segments, basal segment of antennal flagellum with conspicuous pale scales on inner side; eyes separated by slightly less than width of one torus; vertex covered with dark flat scales, a narrow pale line bordering eyes, a triangular pale patch between eyes. *Thorax.* Anterior pronotal lobes very close together, almost touching; upper surface of anterior pronotal lobes largely dark-scaled, with a narrow band of pale scales on anterior margin; scales over most of posterior pronotal lobes broad, flat and pale, those on upper posterior corner dark; mesonotal and scutellar scales all dark, with dull bronze reflection, except for a narrow line of pale brown scales along anterior margin of mesonotum; integument of postnotum dark; postnotal bristles golden or pale brown, mixed with two broad pale scales; wing scales narrow, scales on middle third of vein-2.1 with about five longitudinal striations; anterior fork cell about two times as long as

REMARKS. This species is named in honor of Dr. H. H. Chen, WHO Malaria Advisor in Sarawak, Malaysia, formerly Chief of Entomology Section and Vice Director of Taiwan Provincial Malaria Research Institute (1946-1959). He showed keen interest in the studies of non-anopheline mosquitoes of Taiwan during his service at the Institute.

its stem; anterior surface of hindfemur pale on basal four-fifths; tibiae and tarsi entirely dark. *Abdomen.* Tergites with basal lateral pale patches on I-VII; these patches extensively prolonged at sides, reaching to posterior border on tergites II and III, and almost to posterior border on tergites IV-VI; these patches not extending toward mid-line, invisible from above; tergite VII with basal pale spot; sternites with basal pale band. *Terminalia*(Fig. 2, f-i). Sidepiece comparatively short, wide, and round, with subapical lobe carrying two curved, pointed, unequal spines; bases of spines well separated; three hair-tufts on inner side of sidepiece toward base, two tufts matted and moderately long, other tuft short, hidden between dorsal and ventral sclerotization of sidepiece subapically; sclasper very much expanded apically, with a deep emargination on outer side of expanded portion; spiniform relatively small, pointed; claspette stem wide basally, moderately wide apically, carrying three leaflets at base; claspette filament large, tapering to tip; phallosome divided into two lateral plates, each with about ten teeth and eight spinelets; proctiger ending into a blunt tip with three small round tooth-like projections near apex; ninth tergite divided into two lobes, each with 5-6 small setae; ninth

sternite relatively small, about half as long as sidepiece, apical portion divided into three lobes, large median lobe carrying about 26 scales.

FEMALE (Fig. 1, c, k). Agreeing with male in general coloration. Antenna with sparse flagellar bristles and short pubescence, antennal segments nearly all subequal in length, more apical segments only slightly longer than more basal ones; palpus about one-seventh of length of proboscis; pronotal bristles mixed with a broad pale scale; lateral pale patches on tergites VI and VII visible from above.

PUPA (Fig. 6, g-h). Hair 10-C single or bifid; hair 1-II 3-branched; 2-II about twice length of 3-II; hairs 5-IV, V slightly shorter than segment of attachment; 5-VI only about as long as 4-VI; 9-II-VI nearly as stout as 9-VII; 9-VII single or bifurcated at tip; 9-VIII single, plumose, about half as long as paddle; paddle elongate, narrow near apex; apex of male sidepiece lobes narrow; 1-P single.

LARVA (Fig. 6, a-f). *Head*. Antenna sparsely spiculate; hair 1-A bifid, inserted at basal three-fifths of shaft; hair 1-C slender, curved inward near apex; 3-C tiny, single; 4-C 18-branched, plumose; 5-C 14-16-branched, sparsely plumose; 6-C bifid, 7-C 14-16-branched; 8-C bifid; 9-C single; 10-C 3-4-branched; 11-C large, 14-17-branched, plumose; 12-C 5-6-branched; 13-C 6-7-branched, plumose; 15, 16-C both bifid; mentum with 17 teeth, median hairs of mouth brush simple. *Thorax*. Integument glabrous; hair 0-P 6-7-branched; 1-P trifid, 2-P single; 3-P bifid; 4-P trifid; 5-P trifid; 6-P single; 7-P 4-7-branched; 8-P 5-6-branched; 9-P 3-4-branched; 10, 12-P both single; 11-P tiny, single. *Abdomen*. Integument glabrous; segment VIII with comb of 27-31

uniformly fringed scales; more dorsal 4-6 scales with long basal attachment and very much larger than more ventral scales; hair 1-VIII single, plumose; 2, 4-VIII slender, single, 3, 5-VIII bifid, plumose; siphon without acus; index 3.35 in compressed specimen; hair 1-S single, plumose; pecten of 6-7 teeth, proximal four teeth simple, distal 2-3 teeth with a denticle on one side; anal segment with a sclerotized saddle occupying about one half of segment; posterior border of saddle spiculate; hair 1-X single; 2-X bifid; 3-X single, very long; 4-X consisting of eight hairs, most proximal one and most distal two hairs bifid, others single; anal gills long, about three times as long as anal segment.

TYPE SPECIMENS. Holotype, male (Cu-160.4) with larval and pupal skins, *ex* tree-stump (*Lagerstroemia subcostata*), Peiyuan (260 meters), Tungho Township, Taitung Hsien, Taiwan, December 11, 1967, C. I. Cheng, T. S. Lo; allotype, female (Cu-160.6) with larval and pupal skins, same data as for holotype; paratypes, 14 males (Cu-160.2, .3, .5, .7, .8, .9, .13, .15, .16, .18, .19, .20, .21, .23), 15 females (Cu-160.1, .10, .11, .12, .14, .17, .22, .24, .25, .26, .27, .28, .29, .30, .31) with corresponding larval and pupal skins, and six larvae, same data as for holotype; 19 males (Cu-205.1, .2, .3, .4, .5, .6, .7, .9, .11, .12, .13, .14, .15, .16, .17, .18, .19, .20, .21), two females (Cu-205.8 and .10) and three larvae, *ex* the same tree-stump as for holotype, Peiyuan (260 meters), Tungho Township, Taitung Hsien, February 8, 1968, J. C. Lien, C. I. Cheng, and T. S. Lo.

DISTRIBUTION. Known only from the type locality.

BIOLOGY. The immature stages were found breeding in a tree-stump together with *Orthopodomyia anopheloides* and *Tripteroides bumbusa*

on a forested hill with elevation of 260 meters. The habits of adults are unknown.

SYSTEMATICS. This species differs remarkably from any known species of the genus, however, it shows a close relationship with *H. communis*, *H. greeni*, *H. kanhsienensis*, *H. lii*, *H. macdonaldi*, *H. nivirostris*, n.sp. and *H. taiwanensis* n.sp. in having two spines on subapical lobe of sidepiece. The presence of pale scales on *apn* differentiates this from *H. communis*, *H. greeni*, probably *H. lii* and *H. kanhsienensis* also. It differs from *H. lii* and *H. kanhsienensis* in that

the upper surface of *apn* is clothed with a narrow band of pale scales on anterior margin, from *H. macdonaldi*, *H. nivirostris*, n. sp. and *H. taiwanensis*, n. sp. in having proboscis entirely dark-scaled ventrally. The male clasper and larval comb teeth are very distinctive.

REMARKS. This species is named after Mr. Che I Cheng of the Department of Medical Ecology, U. S. Naval Medical Research Unit, Taipei, Taiwan, who participated in the field collection.

HEIZMANNIA NIVIROSTRIS, N. SP.

MALE (Fig. 3, a-e). *Head*. Palpus dark, about one-sixth length of proboscis; proboscis mainly dark, but with a pale streak on basal two-thirds ventrally, about as long as forefemur, apical one-fourth slightly thickened; clypeus, torus and antenna dark, antenna with sparse flagellar bristles and pubescence, terminal segment almost twice as long as penultimate one, both together about 1.6 times combined length of basal 11 segments; scales on first segment of antennal flagellum dark; torus with a few broad pale scales; eyes separated by less than width of one torus; vertex covered with black metallic broad flat scales on a broad median area on dorsum and silvery white broad flat scales forming a patch anteriorly between eyes and two lateral patches, no pale border around eye margins. *Thorax*. *Apn* entirely white-scaled above; scales on *apn* mostly pale; mesonotum and scutellum covered with black scales showing dull bronze reflection; postnotum with a patch of dark bristles posteriorly; one patch each of silvery white scales present on postspiracular area, propleuron, upper and lower sternopleuron, anterior mesepimeron

and basal portion of all coxae; legs all dark except for a short basal line of pale scales on anterior and posterior of fore- and mid-femora; a rather broad line of pale scales on basal half of hindfemur anteriorly and posteriorly and a line of narrow pale yellow scales running from middle portion of hindtibia to basal one-fifth of first tarsal segment posteriorly; wing scales moderately broad, plume scales on middle third of vein-2.1 with about eight striations; anterior fork cell about two and one-half times as long as its stem; haltere knob dark. *Abdomen*. Tergites entirely dark dorsally, with a narrow pale area at sides on I and a large baso-lateral silvery white patch on II-VII; baso-lateral silvery white patches on II and III extending downward along extreme side and connecting baso-lateral patches on following segment; these patches barely visible from above. *Terminalia* (Fig. 3, a-e). Sidepiece relatively elongate, with subapical lobe carrying two pointed spines; apical tuft of sidepiece very weakly developed, consisting of two normal setae; three hair-tufts on inner side of sidepiece toward base, distal two matted, proximal one slightly twisted,

second distal one bent near base through almost a right angle; claspette stem relatively wide, with two projections near apex; claspette filament more or less divided into three leaflets; clasper short, expanded apically; spiniform stout and pointed, apical half slightly curved inward; phallosome divided into small lateral plates, each with nine teeth; proctiger ending in a single pointed tooth; ninth tergite divided into two lobes, each carrying three small setae; ninth sternite relatively small, about half as long as sidepiece, apical portion divided into three lobes; median lobe apparently carrying four setae.

FEMALE(Fig. 1, b). Agreeing with male in general coloration. Antenna with sparse flagellar dristles and short pubescence, flagellar segments nearly all subequal in length, more apical ones only slightly longer than more basal ones; palpus about one-fifth length of proboscis; torus with some fine narrow pale yellow scales; lines of pale scales on anterior and posterior of hindfemora and posterior of midfemora wider than in male and running nearly for whole length; lateral pale patches on tergite III not extending downward; anterior fork cell about three and one-half times as long as its stem; no line of pale yellow narrow scales on tibio-tarsal joint of hind-femora posteriorly.

PUPA(Fig. 7, g-h). Hair 10-C single or bifid; hair 1-II about 30-branched; 2-II about twice length of 3-II; hairs 5-IV, V, VI shorter than segment of attachment; 9-II-VI finer than 9-VII; 9-VII single; 9-VIII 3-branched; paddle elongate, narrow near apex; apex of male sidepiece lobes narrow; 1-P 3-branched.

LARVA(Fig. 7, a-f). *Head*. Antenna slender, about nine times as long as its basal diameter; hair 1-A 3-4-branched, inserted at about middle of antennal shaft; shaft very

psarsely spiculate and uniformly brown; clypeal spines 1-C slightly stout basally and tapering to tip, about 1.3 times as long as distance between spines, apical portion curved inward; head hair 7-C with 7-8 plumose branches; 6-C with 2-4 plumose branches, one branch longer than others; 5-C with 5 plumose branches; 4-C with 11-15 plumose branches; 8,9-C both fine, single; 10-C 2-4-branched; 11-C with 10 plumose branches; 12-C 6-7-branched; 13-C 4-5-branched; 14-C stout, single or bifid; 15-C bifid; mentum with 20 teeth; median hairs of mouth brush usually strongly pectinate, occasionally single. *Thorax*. Prothoracic hair 0-P 4-5-branched; 1-3-P arising close together, 1-P trifold; 2-P single; 3-P trifold, plumose; 4-P bifid; 5-P bifid, plumose; 6-P single, plumose; 7-P trifold, plumose; 8-P 5-branched; 9-12-P arising from a common plate; 9-P bifid; 10, 12-P both single; 11-P small, furcated into three at tip; 14-P bifid. *Abdomen*. Eighth segment with comb of 20-23 teeth arranged more or less in a triangular patch, most dorsal 8-15 teeth with a strong spine apically and fine fringe laterally, remaining 8-15 teeth with rather coarse fringe apically and fine fringe laterally; hair 1-VIII with four plumose branches; 3-VIII with 4-6 plumose branches; 5-VIII with 3-4 plumose branches; 2,4-VIII both single; siphon without acus, slightly enlarged at middle, index about three in compressed specimen; pecten of 7-9 teeth, each with a few basal denticles on one side; hair 1-S with five branches subventrally at about middle of siphon, branches about length of basal diameter of siphon; anal segment incompletely ringed, anterior border of saddle with a dark brown band; posterior border with fine spicules; hair 1-X with 2-3 plumose branches; 2-X with two long simple branches;

3-X single, long, simple; hair 4-X consisting of eight hairs, all single except for second most distal one which is 2-branched; anal gills fairly broad, about two times as long as anal segment, with rounded ends.

TYPE SPECIMENS. Holotype, male (61733.1) with larval and pupal skins, *ex* bamboo-stump, Laitou, Fanlu, Chiai Hsien, Taiwan, April 15-16, 1961, C.L. Chung; allotype, female (61733.2) with larval and pupal skins, same data as for holotype; paratypes, a female (61733.2) and a pupa with larval skin (61733.3), same data as for holotype. The type specimens are in the collection of Taiwan Provincial Malaria Research Institute, Nankang, Taipei, Taiwan, Republic of China.

HEIZMANNIA TAIWANENSIS, N. SP.

Heizmannia lii Lien, Pacific Insects, 4(3): 622, 1962, *nec* Wu.

MALE (Fig. 3, f-k). *Head*. Palpus dark, about one-eighth length of proboscis; proboscis dark except for a pale basal spot ventrally, about as long as forefemur; clypeus, torus and antenna dark; torus with a few pale scales on inner side; antenna with sparse flagellar bristles and pubescence, terminal segment about 1.5 times as long as penultimate one, both together about 1.5 times combined length of basal 11 segments; scales on first segment of antennal flagellum pale; eyes separated by less than width of one torus; vertex covered with black metallic broad flat scales on broad median area on dorsum and silvery white broad flat scales forming patches laterally and a patch between eyes, no pale border around eye margins. *Thorax*. *A₁pn* with a large patch of silvery white scales anteriorly, occupying most of anterior border and extending about half-way

DISTRIBUTION. Known only from the type locality.

BIOLOGY. The larvae were found breeding in a bamboo-stump on an elevation of 1,000 meters, together with *H. taiwanensis*, n. sp.

SYSTEMATICS. This species is closely related to *H. macdonaldi*, in having a white streak on basal part of proboscis ventrally, but differs from it in having trilobed claspette filament, sharply pointed proctiger, 8-15 sharply pointed larval comb teeth in addition to 8-15 uniformly fringed scales, shorter pupal abdominal hair 3-II which is only about twice the length of 2-II, and multiple branched pupal abdominal hairs I-III and I-IV.

back toward posterior border; *p₁pn* with a large patch of silvery white broad flat scales on upper aspect; mesonotum and scutellum covered with black metallic broad flat scales, a small patch of silvery white broad scales present on mesonotum in front of wing root; some broad flat scales on prescutellar area and midlobe of scutellum appearing dull pale; postnotum with a patch of dark blistles posteriorly (in some specimens there are one or two pale broad flat scales among bristles); a patch each of silvery white broad scales present on lower aspect of paratergite, postspiracular area, subspiracular area, propleuron, posterior half of sternopleuron, and anterior half of mesepimeron; same scales also present on antero-basal part of all coxae; trochanters all with pale scales; legs all dark except for a small pale area at base of fore- and mid-femora ventrally, and a pale broad line running for whole length on both anterior and posterior aspects of hindfemur; tibio-tarsal joint of

hindlegs with some slightly elongate, roughened scales toward ventral aspect; wing scales narrow, plume scales on vein-2.1 with three longitudinal striations; anterior fork cell about two and one-half times as long as its stem; haltere knob dark. *Abdomen*. Tergites dark with a small median spot on tergites IV and V subbasally, a subbasal pale band on tergites VI and VII, a narrow lateral pale area on I, and a large triangular baso-lateral pale patch on II-VII; baso-lateral triangular patch on II extending downward along extreme side and connecting baso-lateral patch on III, others progressively becoming shorter on succeeding segments; sternites with basal pale bands. *Terminalia* (Fig. 3, f-k). Sidepiece relatively elongate, with subapical lobe carrying two pointed spines; apical tuft of sidepiece strongly developed, consisting of six flattened twisted setae; three hair-tufts on inner side of sidepiece toward base, distal two very much twisted, proximal one matted and remarkably long; claspette stem relatively wide, portion beyond attachment of claspette filament hairy and wider than basal portion; claspette filament simple, recurved and pointed apically; clasper short, expanded apically; spiniform stout and blunt; phallosome divided into small lateral plates, each carrying ten or twelve teeth; proctiger ending into a single slightly notched blunt tooth; ninth tergite divided into two lobes, each carrying five setae; ninth sternite relatively small, about half as long as sidepiece apical portion divided into three lobes; median lobe carrying six setae and four scales.

FEMALE (Fig. 1, a). Agreeing with male in general coloration, only differing as follows: Antenna with sparse flagellar bristles and short pubescence, antennal flagellar segments

nearly all subequal in length, more apical segments only slightly longer than more basal ones; silvery white scales between eyes extending posteriorly for a short distance, lateral silvery scale patch extending toward dorsum along eye margins as an incomplete narrow border line to eye margins; some broad flat scales on prescutellar area and midlobe of scutellum appearing paler than in male; a pale streak present on basal half of forefemur posteriorly; abdominal markings much as in male, but in addition one or two broad silvery white scales present on tergites III and VIII medio-subbasally.

PUPA (Fig. 8, g-h). Hair 10-C 2-3-branched, hair 1-II 3-6-branched; 2-II about twice length of 3-II; 5-IV, V, VI shorter than or at most as long as segment of attachment; 9-II-VI finer than 9-VII; 9-VIII 2-3-branched; paddle elongate, narrow near apex; apex of male sidepiece lobes narrow; 1-P single or bifid.

LARVA (Fig. 8, a-f). *Head*. Antenna slender, about nine times as long as its basal diameter; hair 1-A of 2-branches at about middle of antennal shaft; shaft sparsely spiculate, apical half of shaft slightly darkened; hair 1-C slightly stout, curved inward, about as long as distance between hairs; head hair 7-C with 14-15 branches, 6-C with 1-3 branches, one of branches much longer and unusually stout, 5-C with eight branches, 4-C as large as 7-C, with 17-21 branches, 8-C fine, single or bifid; 9-C bifid; 10-C trifid; 11-C 10-11-branched; 12-C 4-branched; 13-C 4-branched; 14-C bifid; 15-C 3-4-branched; mentum with 17 teeth; median hairs of mouth brush usually simple, occasionally strongly pectinate.

Thorax. Prothoracic hairs 1-3-P arising close together, 1-P with 3-4 branches, 2-P single, 3-P bifid, 4-P bifid, 5-P long, inconspicuously

plumose, with 2-3 branches, 6-P single, 7-P with 3-4 branches, 8-P small, with 2-3 branches. *Abdomen*. Eighth segment with comb of 20-25 apically fringed teeth arranged in a triangular patch; hair 1-VIII stellate, with 4-5 branches; 2,4-VIII both single; 3-VIII stellate, with four inconspicuously plumose branches; 5-VIII stellate, with five branches; siphon without acus, slightly enlarged at middle, index 2.6 in compressed specimen; pecten of 7-10 broad, short teeth, each tooth with one or two denticles at base on one side; hair 1-S of two branches, inserted at about middle of siphon; hair slightly longer than basal diameter of siphon; anal segment incompletely ringed, saddle occupying more than one-half length of segment; anterior border of saddle with a narrow dark brown band; posterior border with fine spicules; hair 1-X of three long fairly stout branches; 2-X with two branches; 3-X single, longer than 3-X; hair 4-X consisting of eight hairs, all with two branches except for proximal two smaller hairs which are single; anal gills fairly broad, long, with rounded ends, about 2.5 times as long as anal segment.

TYPE SPECIMENS. Holotype, male (61650.7) with larval and pupal skins, *ex* bamboo-stump, Kuantzulín, Paiho Township, Tainan Hsien, April 7, 1961, J. C. Lien and C. L. Chung; allotype, female (61650.13) with larval and pupal skins, same data as for holotype; paratypes, eight males (61650.1, .2, .4, .5, .8, .9, .10, .11) and four females (61650.3, .6, .12, .14) with corresponding larval and pupal skins, same data as for holotype. The type specimens are in the collection of Taiwan Provincial Malaria Research Institute, Nankang, Taipei, Taiwan, Republic of China.

DISTRIBUTION. Widely distributed in the

region south of 24°40' north latitude in Taiwan Proper, but only rarely encountered.

BIOLOGY. The larva breeds in bamboo-stumps and tree-holes in the forested mountainous region below an elevation of 1,000 meters. The adult female bites man during daytime in forest.

SYSTEMATICS. This species is related to *H. greeni*, *H. lii*, *H. kanhsienensis*, *H. communis*, *H. macdonaldi*, *H. nivirostris*, n. sp. and *H. chengi*, n. sp. in having two strong spines on subapical lobe of sidepiece and to *H. stonei* in having bristles on postnotum with or without one or two broad flat scales (with no scales in majority of the specimens). This differs, however, from all known species in the genus except *H. macdonaldi* and *H. nivirostris*, n. sp. in having a pale basal patch on proboscis ventrally, and from *H. greeni* in having pale scaled *ppn* and less branched larval head hair 5-C (4-6 branches v.s. 12-15 branches as described by Carter & Wijesundara, 1948).

Acknowledgments: This study was supported jointly by U.S. Naval Medical Research Unit No. 2 and Taiwan Provincial Malaria Research Institute. The author wishes to express his sincere thanks to Captain R. H. Watten, Commanding Officer, NAMRU-2, Dr. J. H. Cross, Head of the Department of Medical Ecology, NAMRU-2, and to Dr. M. D. Cates, Entomologist of the Department of Medical Ecology, NAMRU-2 for their support and advice. Thanks are also due to Messrs. P. S. Chen and C. L. Chung for their assistance in the preparation of illustrations, and to other members of the Entomology Section of Taiwan Provincial Malaria Research Institute, and Messrs C. I. Cheng and T. S. Lo of the Department of Medical Ecology, NAMRU-2 for field collection and laboratory rearing of

mosquitoes.

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台灣産蚊族の新種 (双翅目: 蚊科)

第四報 *Mattinglyia catesi*, 新属, 新種と *Heizmannia* 属の四新種

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摘

要

本編では蚊族の五新種の成熟幼虫、蛹及び雌雄成虫に就て記載を行なった。其の中の一新種の爲に一新属 *Mattinglyia* を設けた。他の四新種はいずれも *Heizmannia* 属に属するものである。これ等はそれぞれ *Mattinglyia catesi*, n. gen., n. sp., *Heizmannia cheni*, n. sp., *Heizmannia chengi*, n. sp., *Heizmannia nivirostris*, n. sp., 及び *Heizmannia taiwanensis*, n. sp. と命名された。これ等は悉く台湾本島山岳の森林中で採集された。

新属 *Mattinglyia* は雌成虫の前、中跗節の爪が strongly toothed である点、成虫後楯板に剛毛がない点と lower mesepimeral 剛毛がない点等で *Heizmannia* と異なる。Alula に幅広い鱗片の patch がある点と気門後剛毛が 1~2 本、sternopleural 剛毛が 1~2 本ある点等で *Haemagogus* と異なる。前胸前背板が甚

だ接近している点, paratergite が異常に大きい点と sternopleural 剛毛が1~2本ある点等で *Aedes* と異なる。

Mattinglyia catesi, n. gen., n. sp. の雌成虫は *Mattinglyia achaetae* のそれとは以下の諸点で異なる。吻の長さは前脚腿節の約1.3倍(後者では前脚腿節とほぼ同長), *ppn* には鱗片がないか或るいはその中央部に10枚以下の白鱗があるのみ(後者では *ppn* の上方部を除いては一面に金属光沢を有する銀白鱗にて被われる), 翅の鱗片は幅狭く(後者では幅広く或るいはやや広く), 後脚腿節背面の暗色線斑は基部1/6に限られる(後者では全長に渡る)。

Heizmannia cheni, n. sp. は *H. reidi* に近似するが, 触角第一節の鱗片は黒色(後者では白色), 雄の第九節腹板基部の袋状物は一樣に平滑(後者ではしわがある), 雄の claspette stem は先端に向かい次第に細くなる(後者では先端が膨大する), 及び雄の claspette filament が小さく, 先端尖り, 内側に彎曲する等の点で異なる。 *Heizmannia chengi*, n. sp. は既知種とは甚だしく異なる。雄の外部生殖器の subapical lobe に2本の棘がある点で, *H. communis*, *H. greeni*, *H. kanhsienensis*, *H. lii*, *H. macdonaldi*, *H. nivirostris*, n. sp. と *H. taiwanensis*, n. sp. とに近似を示す。 *Ppn* に白鱗がある点で *H. communis*, *H. greeni*, *H. lii* 及び *H. kanhsienensis*. と異なる。前胸前背板の前縁にある白鱗の帯斑は甚だ幅狭い点で更に *H. lii* 及び *H. kanhsienensis* と異なる。吻の下面部は全く黒色である点で *H. macdonaldi*, *H. nivirostris*, n. sp. 及び *H. taiwanensis*, n. sp. と異なる。雄の clasper と幼虫の comb teeth の形状は甚だ独特である。

H. nivirostris, n. sp. は吻の腹面基部に白線斑がある点で *H. macdonaldi* に近似するが, 雄の claspette filament が三葉, 雄の proctiger 先端は尖り, 幼虫の comb teeth は先端が尖った8-15枚及び一樣に縁飾がある8-15枚の側鱗よりなる, 蛹の腹部第II節の3号毛の長さは2号毛の約二倍である。尚, 蛹の腹部第III, IV節の1号毛は多数に分枝する等の点で後者と異なる。

H. taiwanensis, n. sp. は雄の外部生殖器の subapical lobe に2本の棘がある点で *H. greeni*, *H. lii*, *H. kanhsienensis*, *H. communis*, *H. macdonaldi*, *H. nivirostris*, n. sp. と *H. chengi*, n. sp. とに近似を示し, 成虫の後楯板の剛毛は0-2枚の幅広い白鱗を伴う点で *H. stonei* に近似を示す。吻の腹面基部に白斑がある点で *H. macdonaldi* と *H. nivirostris*, n. sp. とを除くその他の種と異なる。尚, *ppn* の鱗片が白色である点と幼虫頭部5号毛の分枝数が少ない点で *H. greeni* と異なる(前者では4-6に, 後者では12-15に分枝する)。

Fig. 1

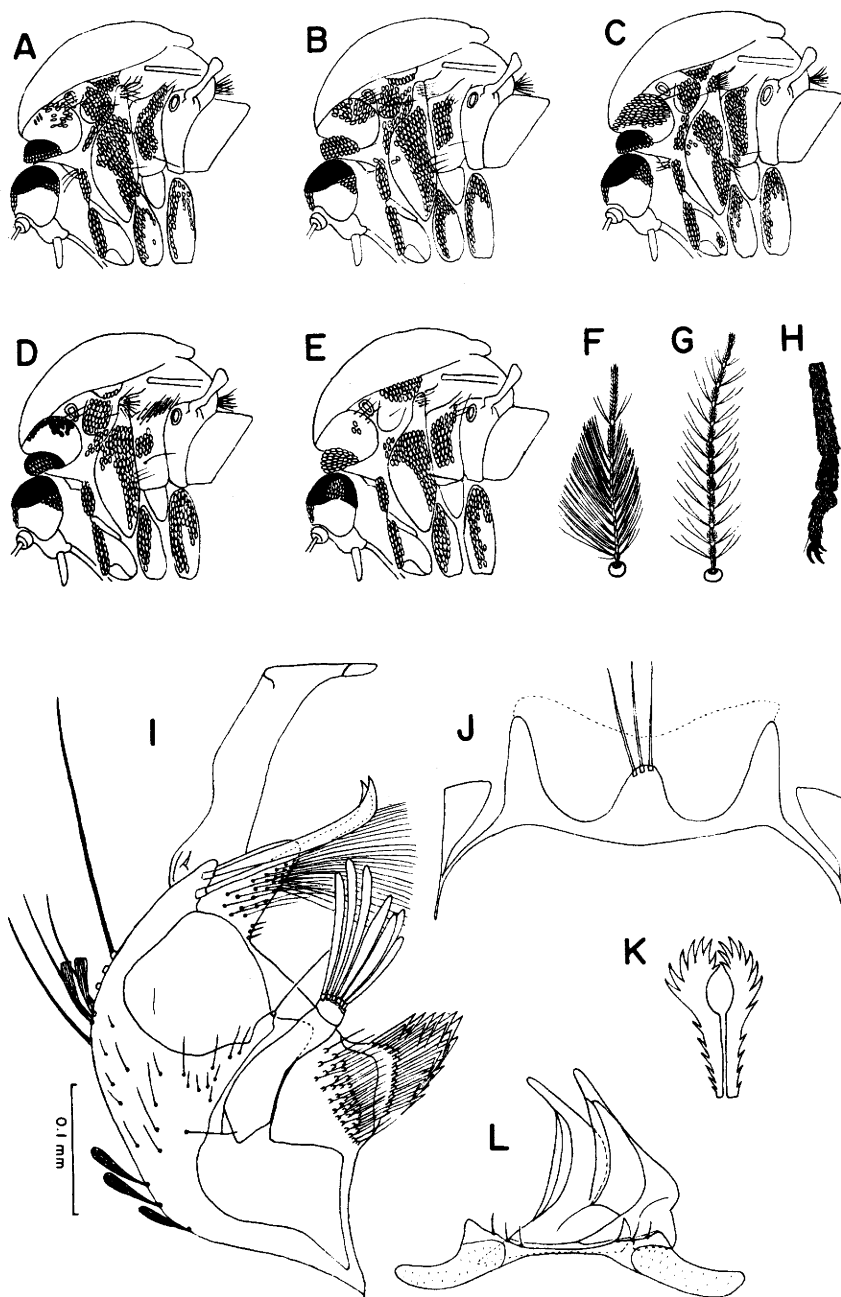


Fig. 1. A-D, pleural marking of females of *Heizmannia*; A, *H. taiwanensis*, n. sp.; B, *H. nivirostris*, n. sp.; C, *H. chengi*, n. sp.; D, *H. cheni*, n. sp.; E-L, *Mattinglyia catesi*, n. gen., n. sp.; E, pleural marking; F, male antenna; G, female antenna; H, last three segments of fore tarsus of male; I-L, terminalia of male; I, clasper, sidepiece and claspette; J, ninth sternite; K, phallosome; L, proctiger and ninth tergite.

Fig. 2

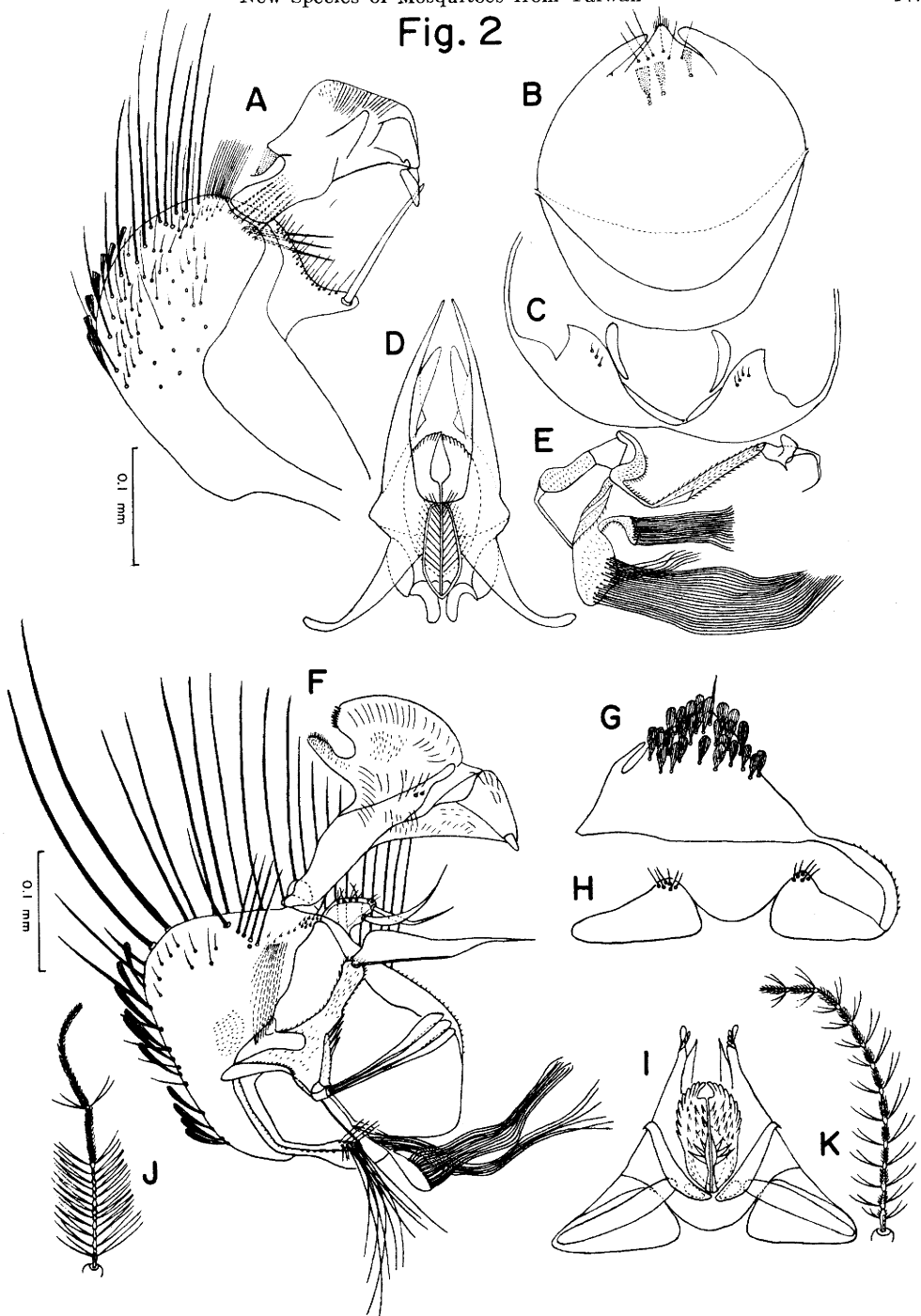


Fig. 2. A-E, male terminalia of *H. cheni*, n. sp. ; A, clasper and sidepiece; B, ninth sternite; C, ninth tergite; D, phallosome and proctiger; E, claspette and hair-tufts; F-I, terminalia of *H. chengi*, n. sp. ; F, clasper, sidepiece, claspette and hair-tufts; G, ninth sternite; H, ninth tergite; I, phallosome and proctiger; J, male antenna of *H. chengi*, n. sp.; K, female antenna of *H. chengi*, n. sp.

Fig. 3

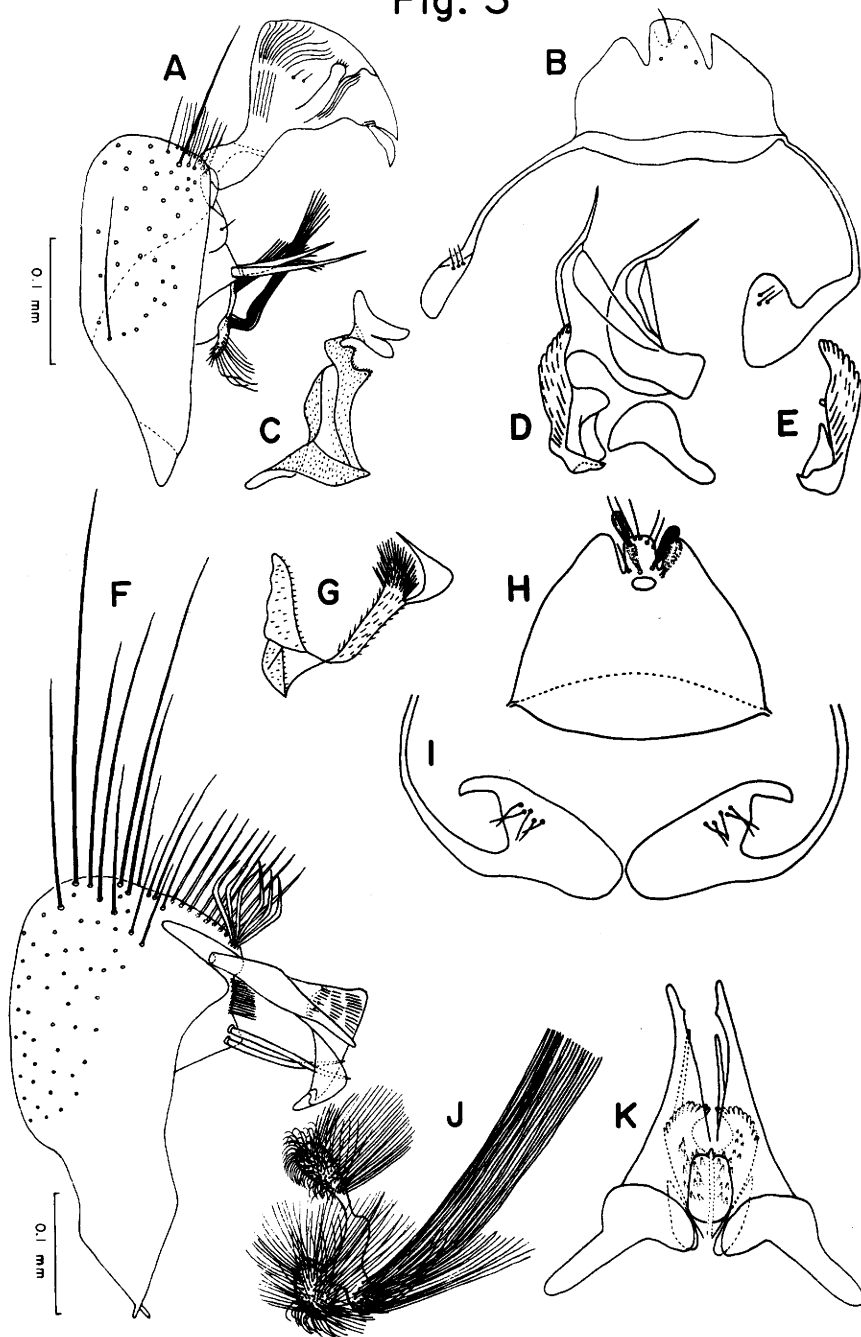


Fig. 3. A-E, male terminalia of *H. nivirostris*, n. sp.; A, clasper, sidepiece and hair-tufts; B, ninth sternite and tergite; C, claspette; D, proctiger and one half of phallosome; E, another half of phallosome; F-K, male terminalia of *H. taiwanensis*, n. sp.; F, clasper and sidepiece; G, claspette; H, ninth sternite; I, ninth tergite; J, hair-tufts; K, phallosome and proctiger.

Fig. 4

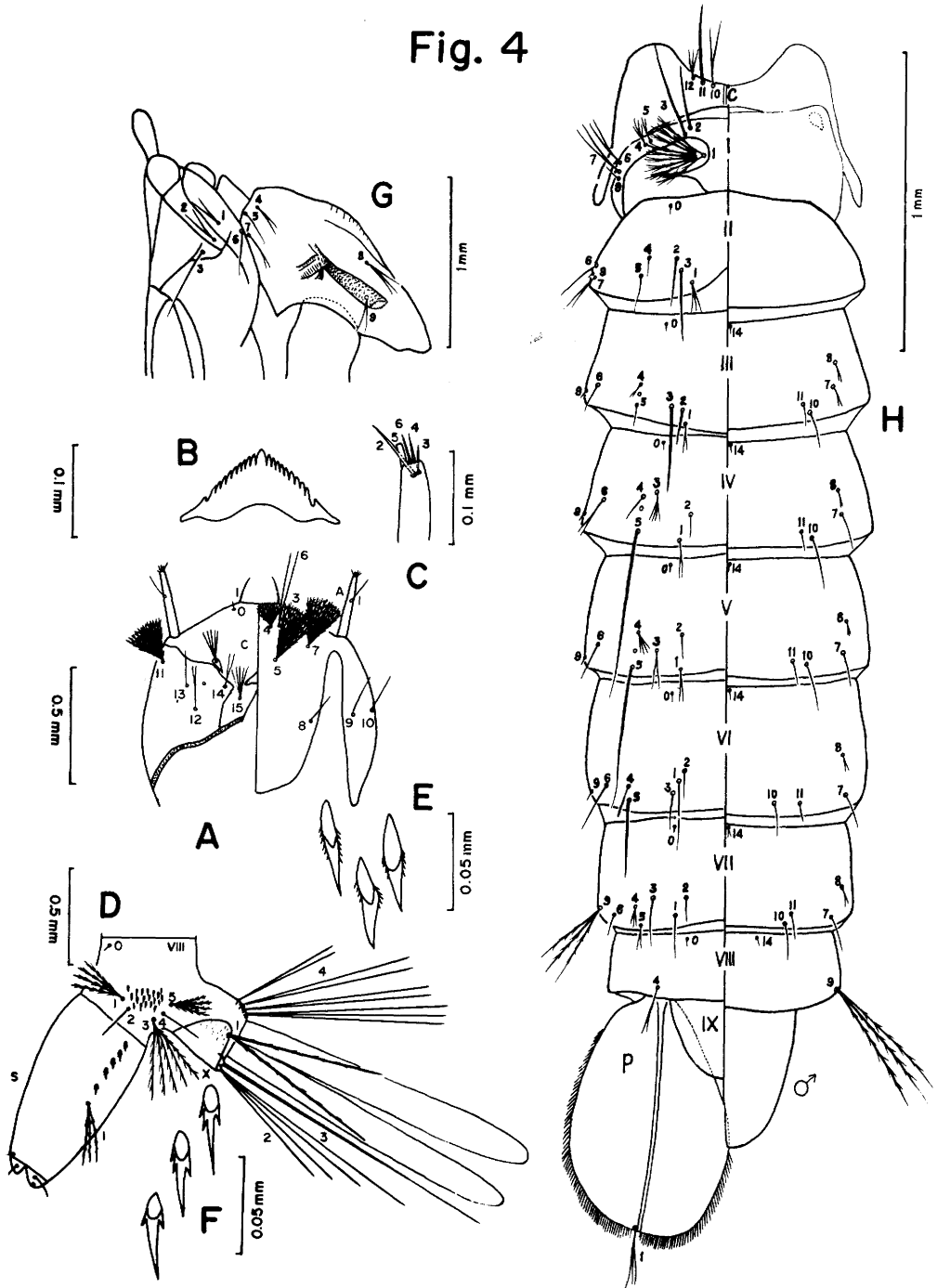


Fig. 4. A-H, *Mattinglyia catesi*, n. gen., n. sp.; A-F, larva; A, head; B, mentum; C, tip of antenna; D, terminal segments; E, comb teeth; F, pecten teeth; G-H, pupa; G, cephalothorax; H, metanotum and abdomen.

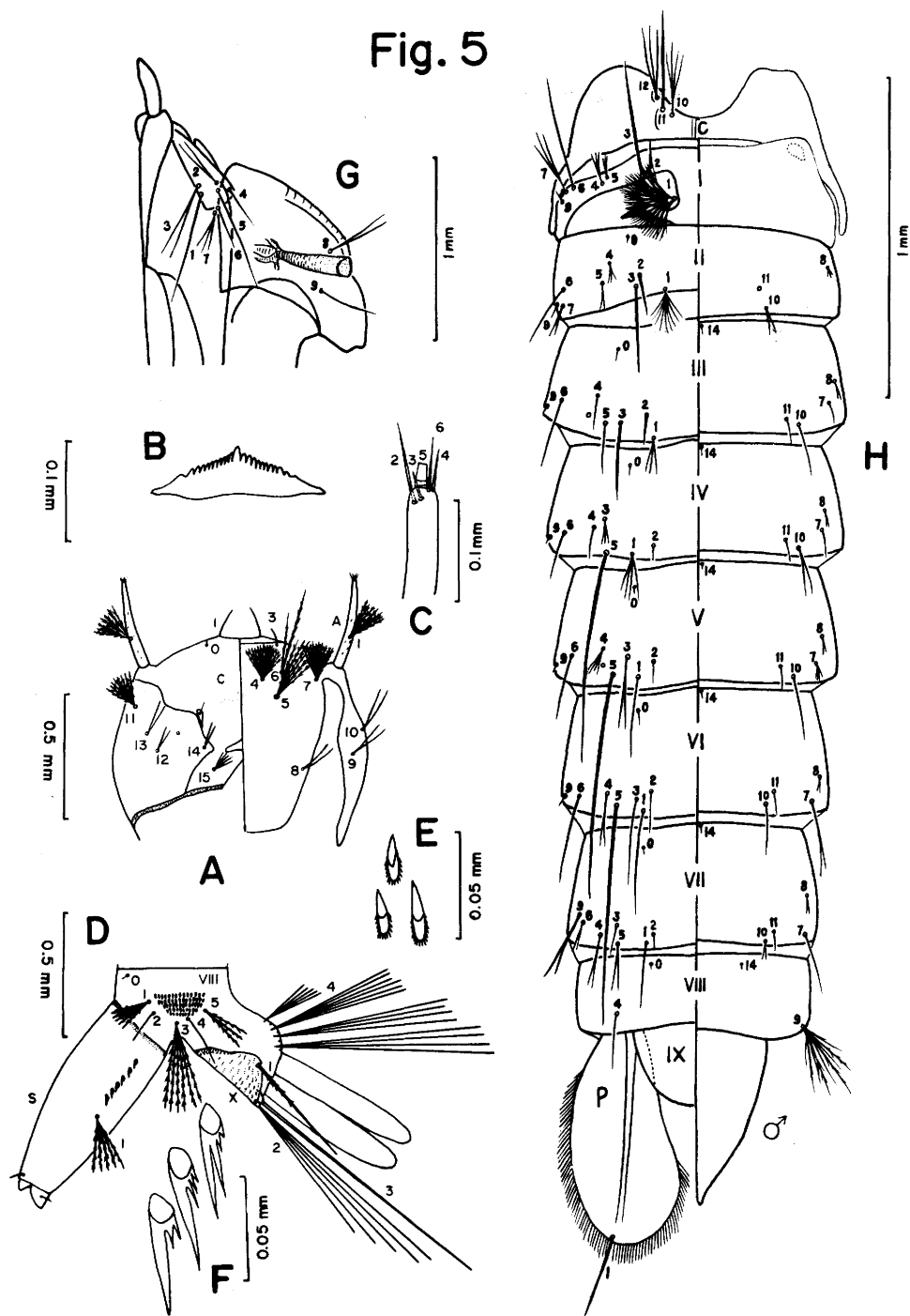


Fig. 5. A-H, *Heizmannia cheni*, n. sp.; A-F, larva; A, head; B, mentum; C, tip of antenna; D, terminal segments; E, comb teeth; F, pecten teeth; G-H, pupa; G, cephalothorax; H, metanotum and abdomen.

Fig. 6

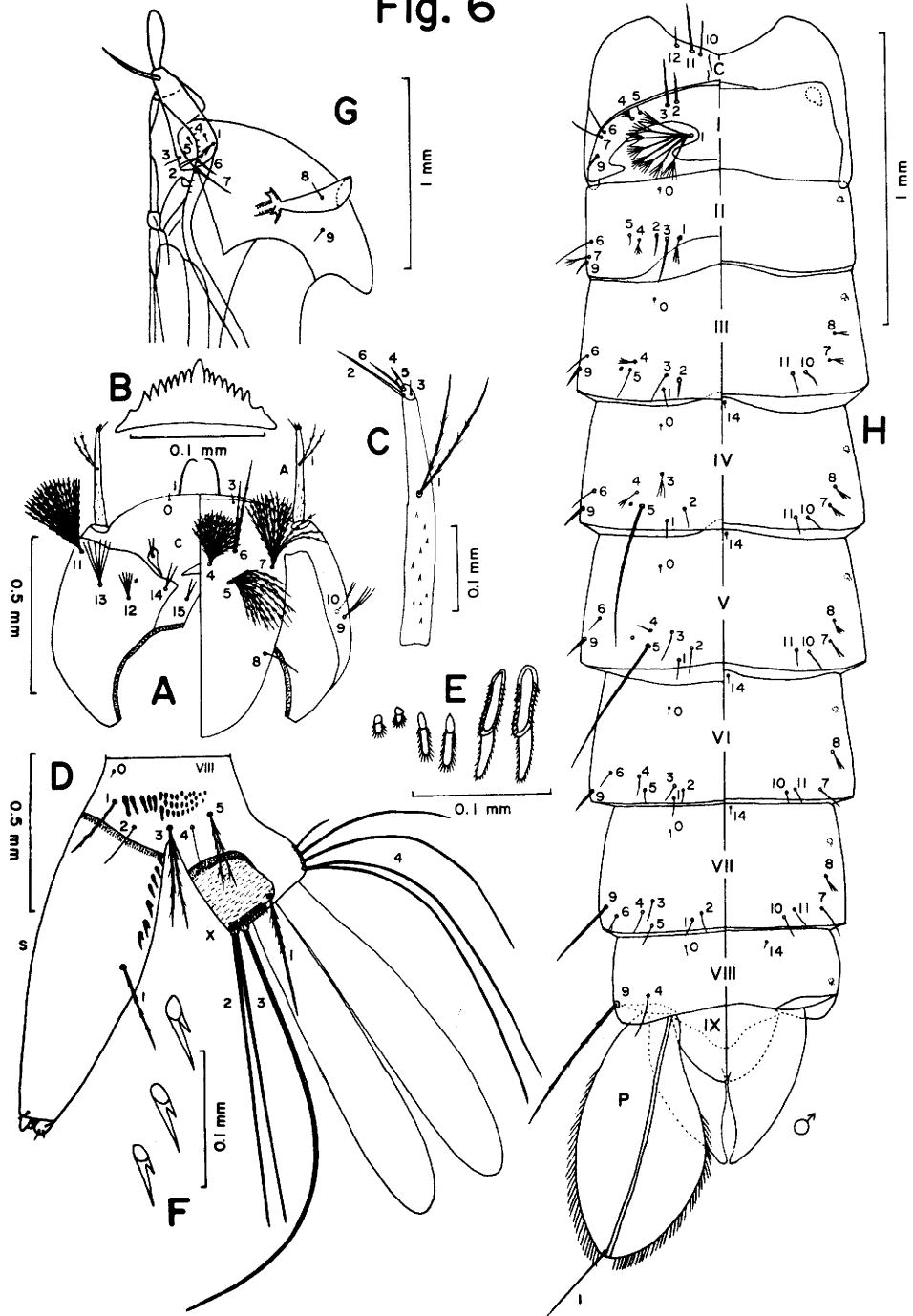


Fig. 6. A-H, *Heizmannia chengi*, n. sp.; A-F, larva; A, head; B, mentum; C, tip of antenna; D, terminal segments; E, comb teeth; F, pecten teeth; G-H, pupa; G, cephalothorax; H, metanotum and abdomen.

Fig. 7

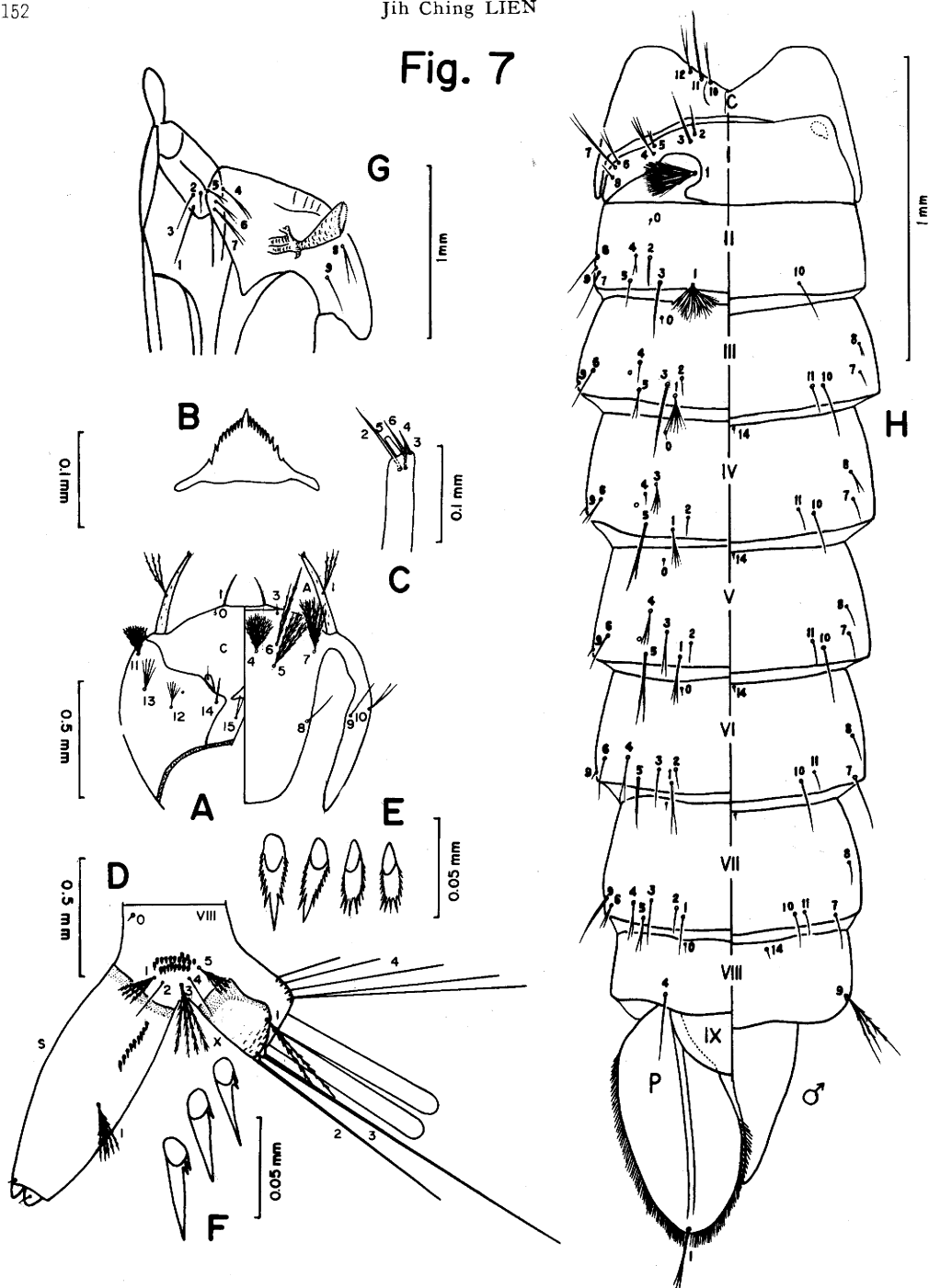


Fig. 7. A-H, *Heizmannia nivirostris*, n. sp.; A-F, larva; A, head; B, mentum; C, tip of antenna; D, terminal segments; E, comb teeth; F, pecten teeth; G-H, pupa; G, cephalothorax; H, metanotum and abdomen.

Fig. 8

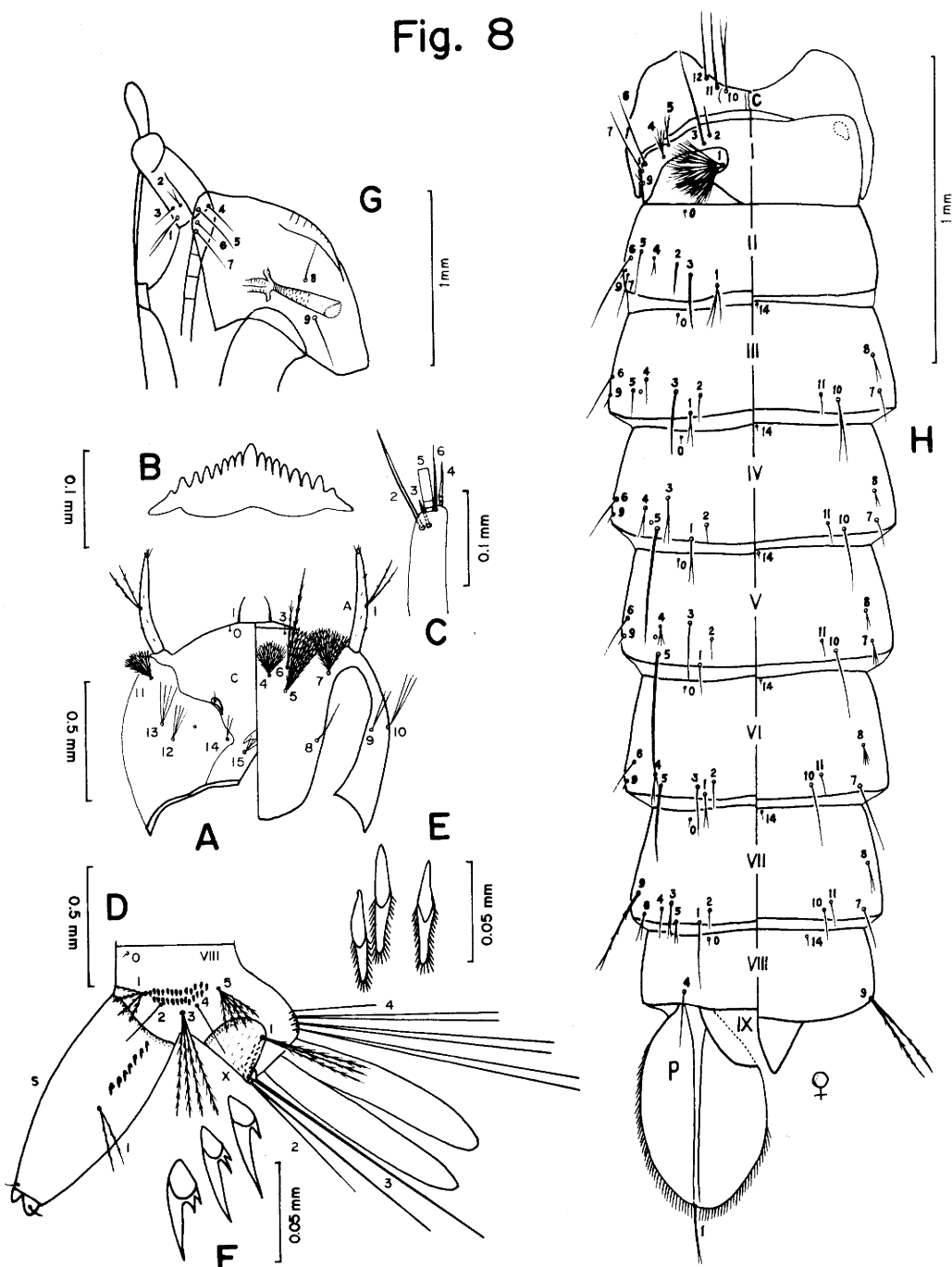


Fig. 8. A-H, *Heizmannia taiwanensis*, n. sp.; A-F, larva; A, head; B, mentum; C, tip of antenna; D, terminal segments; E, comb teeth; F, pecten teeth; G-H, pupa; G, cephalothorax; H, metanotum and abdomen.